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CONTENTS:

New Variety of Sedum Rosea from Southeastern Minnesota and additional Notes on the Flora of the Region. *C. O. Rosendahl and J. W. Moore.* 197

Mexican Station for three Manual-range and Southeastern Plants. *H. E. Moore, Jr.* 202

North American Variety of Equisetum Telmateia. *M. L. Fernald.* 203

Use of Alcohol in Plant Collecting. *W. H. Hodge.* 207

Two Eastern American Species of Iris. *M. L. Fernald.* 210

Two new Forms. *M. L. Fernald.* 216

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Photo. John W. Moore

Sedum Rosea, var. Leedyi, type, × ⅔.

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 49. August, 1947. No. 584.

A NEW VARIETY OF SEDUM ROSEA FROM SOUTH-EASTERN MINNESOTA AND ADDITIONAL NOTES ON THE FLORA OF THE REGION[1, 2]

C. O. Rosendahl and J. W. Moore

(Plate 1086)

1. A New Variety of Sedum Rosea (L.) Scop.*

In September of 1936 John L. Leedy, then a student of the University of Minnesota, discovered a *Sedum* growing on the north face of limestone cliffs along the north fork of the Root River about three miles south of Simpson, Olmsted County, Minnesota. The material brought in was not sufficient for a specific determination and it was suspected at the time that the plants might represent strays from cultivation. Additional specimens from the same locality were collected by Mr. Leedy in July of 1938 and again in July of 1942. In September of 1942 John W. Moore in company with Mr. Leedy and E. P. Thatcher secured staminate and pistillate plants. A study of these collections has proven them to be *Sedum Rosea* (L.) Scop. The plants are polygamodioecious with only a few perfect flowers. Their habit is sufficiently different from the typical form and all the described American varieties to warrant describing the entity as a new variety.

[1] Contributions from the Herbarium of the University of Minnesota IV.

[2] The field work was supported in part by grants in aid of research from the Graduate School of the University of Minnesota.

* The orthography of Sedum Rosea has been discussed by M. L. Fernald in Rhodora 49; 79-81, 1947.

SEDUM ROSEA (L.) Scop. var. **Leedyi** varietas nova[3] (Plate 1086) A varietate typica differt; caules altiores, usque ad 45 cm. alti; folia plura, in caule usque ad 90, pro rata longiora angustioraque, longiora quam sunt lata circiter sexiens et dimidia parte, aut plerumque integra aut paucis dentibus remotis et extensis et exstantibus supra medium instructa; flores staminiferi petalis purpurellis pistilliferi petalis viridibus et eodem tempore flavis instructi; fructus pedicellis longioribus gracilioribusque instructus.—The type collection consists of staminate plants and pistillate plants each with a few perfect flowers. From northeast-facing limestone cliffs, north branch of the Root River opposite the Herman McDaniel farm about 3 miles south of Simpson, Minnesota, July 12, 1942, *John L. Leedy* (Herb. Minn.). Additional specimens from the same locality are: July 23, 1938, *Leedy;* and September 24, 1942, *Moore, Leedy, and Thatcher,* No. 15691.

In the species as well as all of the hitherto described American varieties the leaves are obovate, less numerous per stem, mostly up to 3½ times longer than broad, entire or more often with few to several low teeth. In the new variety the leaves are narrowly oblanceolate, averaging 6½ times longer than broad, mostly entire or with a few prominent, porrect, irregularly spaced teeth above the middle.

2. JEFFERSONIA AND SOME OTHER LOCAL PLANTS OF SOUTHEASTERN MINNESOTA

A recent find which marks a very considerable northwestward extension of range of a typical alleghenian species is the occurrence of *Jeffersonia diphylla* (L.) Pers. in the upper gorge of the White Water River in Winona County. The station is about thirty miles northeast from where the *Sedum* occurs. This discovery, too, is credited to one of our botany students, Mr. Arnold Schultz. On the sixteenth of June, 1942, in company with the late F. K. Butters and Mr. Schultz the writers visited the place and found *Jeffersonia* growing in abundance on the steep talus slope of towering dolomite cliffs. The plants were past the blossoming stage but ample fruiting specimens were collected and prepared for herbarium record.[4]

[3] The variety is named for John L. Leedy.

[4] Upper gorge of the White Water River, St. Charles Township, SE¼ Sect. 1, Winona County, Minnesota, June 16, 1942, *Rosendahl, Butters, Moore, and Schultz,* No. 7538.

Other plants of local occurrence in southeastern Minnesota associated with *Jeffersonia* were: CYSTOPTERIS FRAGILIS (L.) Bernh. var. PROTRUSA Weatherby, No. 7530; MILIUM EFFUSUM L., No. 7556; ZIGADENUS GLAUCUS Nutt., No. 7537; VIOLA ERIOCARPA Schwein., No. 7555; HYDRASTIS CANADENSIS L., No. 7551. In Minnesota *Hydrastis* is now known to grow only in Winona County. Although it was reported from Stearns County by Upham[5], we have seen no specimens to substantiate this report. The only other collections of *Hydrastis* in the University of Minnesota Herbarium are those of J. M. Holzinger made in Winona County in May 1899, and his Bear Creek, Winona County specimens collected in May 1901.

On a subsequent collecting trip to the same station ASTER SHORTII Lindl. ex Hooker was collected in the proximity of the *Jeffersonia* patch, Oct. 4, 1946, *Moore and Huff*, No. 19343. It was found to be locally abundant. I. A. Lapham lists *Aster Shortii* without locality[6] and Warren Upham[7] reports it from the "Southeast" part of the state and cites Lapham. Extant specimens in the University of Minnesota Herbarium are three sheets collected at Lanesboro, Fillmore County, by J. H. Hvoslef, and a specimen collected on a wooded slope of a valley 3–4 miles north of Choice, also in Fillmore County, August 14, 1927, *Rosendahl*, No. 5368.

On a west-facing slope near where *Jeffersonia* was found POA SYLVESTRIS A. Gray was encountered along a "wood road" (No. 7529). At present this is the only known station for the grass in Minnesota, but it may prove to be less scarce in the southeastern part of the state than indicated, for it had previously been collected in Winneshiek County, Iowa, near the Iowa-Minnesota state line, June 24, 1915, *Rosendahl*, No. 3055. Farther down the above mentioned slope CAREX CEPHALOIDEA Dewey grew in moist soil along the roadside, No. 7543. The

[5] Upham, Warren, Catalogue of the Flora of Minnesota, the Geological and Natural History Survey of Minnesota, Part VI of the Annual Report of Progress for the Year 1883, p. 20, 1884.

[6] Lapham, I. A., A Catalogue of the Plants of Minnesota. Report of the State Horticultural Society for 1875, p. 101. Professor N. C. Fassett has informed us that he has not been able to locate any Lapham specimens of *Aster Shortii* from Minnesota in the University of Wisconsin Herbarium.

[7] Upham, Warren, Catalogue of the Flora of Minnesota, The Geological and Natural History Survey of Minnesota, Part VI of the Annual Report of Progress for the Year 1883, p. 71, 1884.

species is evidently of very rare and local occurrence in the state for it is represented by only one other collection, namely that of *Rosendahl and Butters* No. 3246, June 14, 1916, from boggy bottomlands five miles east of Mankato[8].

Despite a good deal of careful collecting in southeastern Minnesota covering a period of nearly fifty years the following species are known mostly from only one or rarely from two or three closely contiguous stations.

BOTRYCHIUM DISSECTUM Spreng. was collected in Nerstrand Woods, a hardwood forest in Rice County, SE¼, Sect. 9, Wheeling Township, October 5, 1930, *Rosendahl*, No. 6398. In 1931 this specimen was reported upon by E. W. Graves[9], but the locality there given is not too exact. This is the typical form of the species, and is not known to occur in any other locality in Minnesota. The plant is of very rare occurrence west of the Mississippi River. Only five localities were given by Mr. Graves west of that river throughout its entire course.

PELLAEA ATROPURPUREA (L.) Link is known to grow at one station, Jefferson, Houston County, August 3, 1899, *H. L. Lyon*, where it was collected a second time on August 20, 1936, *Rosendahl and Butters*, No. 6700.

ECHINOCHLOA WALTERI (Pursh) Nash[10]. This Cockspur Grass is represented by a single collection from a quaking bog on the Mississippi River bottoms, Weaver, Wabasha County, August 28, 1926, *Fassett and Hotchkiss*, No. 2906. N. C. Fassett has cited this specimen in RHODORA, **32**: 58, 1930.

MELICA NITENS Nutt. ex Piper is known from two stations along the Root River. In 1902 it was discovered 3–4 miles northeast of Whalen, Sect. 2, Holt Township, Fillmore County, *Rosendahl*, No. 592[11] and a mile or so down stream at a point three miles west of Rushford in sandy soil of wooded roadside, Fillmore County, June 21, 1915, *Rosendahl and Butters*, No. 2995. The specimens in question are typical *Melica nitens* Nutt. ex Piper.

[8] An earlier report by the senior author of the occurrence of *Carex cephaloidea* in southeastern Minnesota has proved to be incorrect. It was based on his collections No. 433 and 457 from Spring Grove, Houston County, both of which are *Carex gravida* Bailey.

[9] Graves, E. W., *Botrychium dissectum* from Minnesota, American Fern Journal, **21**: 21–24, January–March, 1931.

[10] This species was first reported by W. A. Wheeler, Minnesota Botanical Studies, **3**: 84–85, 1903. However, it seems apparent that the specimens there listed were the long-bearded variety of *Echinochloa Crus-galli* (L.) Beauv. This also applies to John B. Moyle's report in RHODORA, **40**: 275, 1938. The plants cited in his article all belong to *Echinochloa Crus-galli* (L.) Beauv. var. *longiseta* (Trin.) Hara. At present *Echinochloa Walteri* is known only from Weaver.

[11] This collection was reported in 1903 as *Melica diffusa* Pursh, Rosendahl, C. O., Minnesota Botanical Studies, **3**: 261, July 3, 1903.

LEERSIA LENTICULARIS Michx. has been collected at three stations: Jefferson, Houston County, August 17, 1900 by *H. L. Lyon;* in wet woods near West Newton, Weaver, Wabasha Co., Aug. 23, 1926, *Fassett and Hotchkiss,* No. 3060 (Herb. Gray)[12]; and Winona, *J. M. Holzinger,* No. 33, without definite date, (Herb. Gray).

POA WOLFII Scribn. is known from a single collection from a woods on a sandy hillside near Spring Grove, Houston County, June 3, 1902, *Rosendahl,* No. 285.

CAREX CRUS-CORVI Shuttlw. comes from two stations: one collection is from Red Wing, Goodhue County, August 1885, *Sandberg;* and one from a shady swale, near foot of West Newton slough, Weaver, Wabasha County, August 23, 1926, *Fassett and Hotchkiss,* No. 3087 (Herb. Gray).

CAREX LAEVIVAGINATA (Kükenth.) Mackenzie is from a creek-bed in moist soil near Spring Grove, Houston County, June 10, 1902, *Rosendahl,* No. 456.

CORALLORHIZA ODONTORHIZA Nutt, has been collected but once in Minnesota, in white oak, red oak, shellbark hickory forest, Sect. 22, Spring Grove Township, Houston County, August 1899, *Rosendahl,* No. 1158. This collection was examined by Mr. A. M. Fuller who established its identity. The occurrence of this late-flowering coral-root in Minnesota was first noted by him in the Orchids of Wisconsin[13].

PARONYCHIA CANADENSIS (L.) Wood, a plant previously known as *Anychia canadensis* (L.) B. S. P., was first reported from Minnesota by I. A. Lapham under the name *Anychia dichotoma* Michx. as early as 1875[14]. J. M. Holzinger collected it on Trempealeau Mountain in Wisconsin, a high island in the Mississippi River below Winona, August, 1897. Two years later the plant was collected near Spring Grove, Houston County, August 25, 1899, *Rosendahl,* No. 1160, and again at the same station, July 30, 1909, No. 2322, August 3, 1919, No. 3846, and June 27, 1920, *Rosendahl and Butters,* No. 3929. Aside from this locality no specimens have been seen from elsewhere in Minnesota.

RORIPPA SESSILIFLORA (Nutt.) Hitchc. is known from two stations, Red Wing, Goodhue County, August 1884, *Sandberg,* and Winona, Winona County, August 1886, *Holzinger.*

[12] All collections cited in this paper are in the Herbarium of the University of Minnesota except those which are designated Herb. Gray which are in the Gray Herbarium, Harvard University, Cambridge, Massachusetts.

[13] Fuller, Albert M., Studies on the Flora of Wisconsin Part I: The Orchids; Orchidaceae, Bull. Pub. Mus. of the City of Milwaukee, **14**: No. 1, Feb. 1933, p. 139, map 24, p. 141.

[14] Lapham, I. A., A Catalogue of the Plants of Minnesota. Report of the State Horticultural Society for 1875, p. 94. A check was made at the University of Wisconsin Herbarium by N. C. Fassett and no Lapham specimen of this plant from Minnesota seemed to be extant. The report may well have been based upon a field determination.

Saxifraga Forbesii Vasey has been found on wet sandstone ledges, northwest base of Gwinn's Bluff, Winona County. Presumably J. M. Holzinger's collection from a sandy wet spot of June 1886 was from the same locality. Collections are May 3, 1925, *Rosendahl*, No. 4789; July 2, 1920, *Rosendahl and Butters*, No. 3965, and the Holzinger specimen.

Asclepias purpurascens L. was collected twice at Lake City in 1883: Lake City, Wabasha County, July 18, 1883, *Sara Manning*, and Lake City, July 23, 1883, *W. H. Manning* (Herb. Gray).

Aureolaria grandiflora (Benth.) Pennell var. pulchra Pennell is represented by one collection from the Winnebago Valley, Houston County, August 12, 1899, *Wheeler*, No. 512.

Prenanthes crepidinea Michx. is known from only a single collection, Jefferson, Houston County, August 29, 1900, *Lyon*, No. 755.

Department of Botany,
University of Minnesota, Minneapolis.

A Mexican Station for three Manual-range and Southeastern Plants.—Scirpus rubricosus Fern. (*S. Eriophorum* Michx.) and Tovara virginiana (L.) Raf. are represented in the Gray Herbarium by collections from Gray's Manual range and south to Florida and west to eastern Texas: the former in swamps, marshes and low woods to Dallas Co., Texas; the latter in rich woodlands and thickets to San Jacinto Co., Texas.

In early November, 1946, the writer had the opportunity of collecting about Lake Atexca near Molango in the state of Hidalgo, Mexico, where the two were discovered in close proximity: *Scirpus rubricosus* in shallow water of the marginal marsh (No. 2022), *Tovara virginiana* in moist thickets by the lakeside (No. 2024). This station, at about 1400 meters elevation, represents a southern extension into Mexico of approximately seven hundred miles for these species.

At another section of the bordering marsh, a third species of interest, Habenaria repens Nutt. (No. 1932), formed an extensive colony among cattails and water-hyacinths. This plant does not extend into the Manual range but is found in swamps, ponds and lake-shores from North Carolina south to Florida and west to eastern Texas in the United States. Known also from

Central America, the West Indies and South America, its presence in Mexico is now authenticated.

The *Habenaria* was determined by Dr. Donovan S. Correll. Numbers cited are those of the writer and specimens have been deposited at the Gray Herbarium.—H. E. Moore, Jr., Gray Herbarium.

THE NORTH AMERICAN VARIETY OF EQUISETUM TELMATEIA

M. L. Fernald

The name *Equisetum Telmateia* Ehrh. in Hannövers. Mag., 1783: 287 and Beitr. ii. 159 (1788), so long used in both Europe and America, has twice given way, at least temporarily, in recent European publications to earlier competitors. A majority of European taxonomists, Ascherson & Graebner, Hegi, Rouy, Britten & Rendle, Briquet and many others, have taken up, without expressing any doubt, the earlier *E. maximum* Lam. Fl. Franç. i. (7) (1778), although Milde, Mon. Equiset. 19 (1865), maintained that *E. maximum* was a mixture of *E. arvense* L. and *E. Telmateia*. Since *E. arvense* dated from 1753, the removal of that element (if it were there) left *E. maximum* for the large species which, to quote Lamarck, "s'élèvent à la hauteur de trois pieds". At the time these later authors were writing, that conclusion seemed justified and the name *E. maximum* the correct one for the species. But now the International Rules have undergone so many alterations that *E. maximum* has become invalidated! Unfortunately, Lamarck was giving a new name to a species which he thought to have an earlier binomial; for before his description he cited as identical with his *E. maximum* the "*Equisetum fluviatile*. Lin. Sp. 1517" (i. e. *E. fluviatile* L. Sp. Pl. ed. 1: 1062 (1753) and ed. 2: 1517 (1763), priority of publication then considered a secondary matter. Since Lamarck considered his new *E. maximum* the same as the earlier *E. fluviatile* his new name was illegitimate and by Art. 61 of the International Rules can not be accepted.

Another and still earlier name got temporarily into use for the Giant Horsetail, *Equisetum Telmateia*. This was *E. majus* Garsault, Traité des Plantes et Animaux, ii. 166, pl. 258 A (1767),

which was taken up and supported with seemingly sound logic by Thellung in his detailed article, *Nomenclator Garsaultianus* in Bull. Herb. Boiss. sér. 2, viii. no. 11: 778–793 (Oct. 31, 1908). In the next year Schinz & Thellung, in their searching study of the nomenclature of Swiss plants, in Vierteljahrs. Naturforsch. Gesellsch. Zürich, liii. 515 (1909), clearly showed its priority over both *E. maximum* (1778) and *E. Telmateia* (1783). But again a change in the International Rules now throws it out, for by Art. 68 (4) "Specific epithets are illegitimate . . . (4) When they were published in works in which the Linnaean system of binary nomenclature for species was not consistently employed". There is no question about the failure "consistently to employ" "the Linnaean system of binary nomenclature" in Garsault's work. This was definitely asserted by Britten & Rendle in Journ. Bot. xlvii. 322 (1909) in their criticism of Thellung's interpretation. Their concluding paragraph, however, makes one laugh: "It is absurd to attempt a parallel, as Dr. Thellung does, between the nomenclature of Miller's *Gardeners Dictionary*, ed. viii., and that of Garsault. In this edition Miller, as he says in his preface, entirely followed Linnaeus's method; his nomenclature is that of Linnaeus except for additions which also follow the binominal system".[1] It would seem probable that Britten & Rendle must sometime have seen Miller's ed. 8. The following quotation from

[1] To some minds Miller's statement in his Preface, that he was following the method of Linnaeus, does not necessarily mean that he said that he was consistently using binomials. Miller's emphasis was on the *system* of classification, as shown by his own words:

"In the last edition [which was largely polynomial] of this work, the author adopted in a great measure the system of Linnaeus, which was the prevailing method of ranging plants then in use among botanists; but as many of the plants which were treated of in the Gardeners Dictionary, were not to be found in any of Linnaeus's works then published, Tournefort's system was also applied to take in such as were not fully known to Dr. Linnaeus; but since that time the learned professor having made great additions to his works, and those additions being generally consulted for the names of plants, the author has now applied Linnaeus's method entirely, except in such particulars, where the Doctor not having had an opportunity of seeing the plants growing, they are ranged by him in wrong classes: as for instance, the Ilex or agrifolium is ranged in his fourth class, with those plants whose flowers have four stamina or male organs, and four stigmas or female parts of generation; whereas those plants have male flowers upon some, and female upon other plants. The Laurus Linnaeus has placed in his ninth class, with those plants whose flowers have nine stamina or male organs of generation, and one female part; but these plants should also be ranged in his twenty-second class, for all the species of this genus have male and female flowers on different plants. These, with some other alterations from Linnaeus's system, have been made in this edition, where the author has given his reasons for so doing, which he hopes will be approved by the public."

Dr. E. D. Merrill's defense of the prevailingly binomial nomenclature of William Bartram clearly shows how futile it is to assert that "In this edition Miller . . . entirely followed Linnaeus's method": "About a week before I received the final proofs of this paper Professor M. L. Fernald called my attention to edition 8 of 'The Gardener's Dictionary' by Philip Miller (1768), the edition in which he changed his entries to the binomial system. He was distinctly inconsistent, for while most of the plant names are binomials, there are a considerable number of monomials and a distinctly large number of descriptive phrases. Thus in the entries under the letter A, with about 560 binomials, there are eighteen polynomials in the form of pre-Linnaean descriptive sentences. Examples are 'Alchemilla foliis lobatis sericeis acutis' (4 binomials under *Alchemilla*); 'Aloe foliis erectis subulatis radicatis undique inerme spinosis' (22 binomials under *Aloe*); and 'Asparagus caule herbaceo erecto, foliis setaceis . . .' (9 binomials under *Asparagus*). I merely cite this standard work, which all taxonomists accept as a source of both generic and specific names, as supporting my contention that Bartram's botanical names should be accepted. Certainly if Bartram's 'Travels' be eliminated, so logically should all the names in Miller's edition of 1768 be discarded, for he was more inconsistent than was Bartram. His intention was clear, in that he accepted the binomial system even if, in a certain percentage of cases he also included cumbersome pre-Linnaean descriptive sentences as the names for certain species that he recognized."[2] Garsault's book may with justification be rejected because, according to Thellung, the author obviously used uninomials (282), binomials (336) and polynomials (71), intending as Britten & Rendle say, "to use no system, binominal or otherwise".[3] So now, until the British force through another change in the International Rules

[2] Merrill in Bartonia, no. 23: 35 (1945).

[3] This whole problem of deciding what an early author really intended, when his practise was inconsistent, is a baffling one and liable to utterly conflicting interpretations. What to one student seems to be a work in which "the Linnean system of binary nomenclature for species was not consistently employed", to another sometimes seems just the reverse. Witness Sprague's argument in Journ. Bot. lxxvii. 343 et seq. (Dec. 1939), that Oeder's binomials, interspersed among many polynomials, in Flora Danica, vol. iii, are not invalidated, because most of his species had binomials; and my reply, with photographic reproductions from Oeder's pages, in RHODORA, xlii. 267–269 (1940). As I there state, Art. 68 (4) was one proposed by the British botanists "to remove various sources of ambiguity". So long as ambiguity and contradictory interpretations prevail we are not very near to clarity.

and give us their strictly legalistic interpretation of what they are supposed to mean, we may go back hopefully to the present survivor, *E. Telmateia* Ehrh.

As to the American representative of *Equisetum Telmateia*, the story is brief. In 1862 Milde described in great detail a small fragment, scarcely 4 inches long, of a sterile stem brought to Buchenau in Bremen by a traveller who had picked it near Sonoma, California, this being *E. Braunii* (the name of the collector being Pajeken) of Milde in Verhandl. Zool.-botan. Gesellsch. in Wien, 1862: 515, this later treated as *E. Telmateia*, var. *Braunii* (Milde) Milde, Mon. Equiset. 246, t. v, fig. 22 (1865). There is no need here to repeat in detail all the minute morphological and anatomical differences pointed out by Milde, the most obvious one emphasized by Luerssen, Farnpflanzen, 676—Rabenhorst, Krytogam.-Fl., ed. 2, iii. 676 (1889). Milde did not have the fertile stem, but merely a fragment of a sterile one. Perhaps the most striking departure of the North American plant (British Columbia to southern California; Keweenaw Peninsula, Michigan) is in the former. Taking the characters from Eurasian specimens and the detailed descriptions of Milde, Luerssen and other European specialists, and from North American specimens and the careful description by Abrams, we get the following contrasts.

Equisetum Telmateia. *Fertile stem:* 1.5–2.5 (rarely in green-branched forms –5) dm. high, 6–13 mm. thick; sheaths (except lowest), including teeth, 1.5–4 cm. long, all but the uppermost with 20–35 free slender teeth 5–10 mm. long, the uppermost with teeth free or but slightly united in pairs. *Sterile stem:* elongating to 0.5–1.2 (very rarely –2) m. high, with broadly convex smooth or smoothish ribs.

Var. Braunii. *Fertile stem* 2.5–6 dm. high, 1–2.5 cm. thick; sheaths 4–9.5 cm. long, with 20–30 lanceolate teeth united by 2's or 3's. *Sterile stem* becoming 0.5–3 m. high, with prominently angled ribs commonly scabrous with siliceous processes.

Other, chiefly anatomical, differences presumably exist, these to be worked out by specialists on the *Pteridophyta* (although Milde noted several), but enough superficial characters exist to demonstrate that *Equisetum Telmateia*, var. *Braunii* is not identical with the European plant, a fact clearly brought out by Milde eighty-five years ago. The occurrence of the plant of the Pacific Slope as an isolated colony on Keweenaw Peninsula (see C. K. Dodge in Fern. Bull. xx. 16 (1912), a specimen with more detailed local data in Gray Herb.) is highly significant in view of the oc-

currence there or elsewhere in its neighborhood of completely isolated plants not generally found east of the Continental Divide, such as *Ceanothus sanguineus* Pursh, *Vaccinium membranaceum* Dougl., *Adenocaulon bicolor* Hook. and many others discussed by me in Rhodora, xxxvii., nos. 438–441, their segregation shown in maps 6, 7, and 9 (1935).

Characteristic illustrations of the fertile stems of the two varieties of *Equisetum Telmateia* are the following. Of true European E. Telmateia: Milde, Mon. Equiset. t. v, fig. 28 (1865); Pratt, Grasses, Sedges & Ferns Gr. Brit. ed. 3. vi. t. 313 (1873); Syme, Engl. Bot. xii. t. 1888 (1886); Bergdolt in Hegi, Ill. Fl. Mittel-Eur. i. t. 9, fig. 2 (1908). Of the North American var. Braunii: Clute, Fern Allies, 59 (1905); Abrams, Ill. Fl. Pacific States, i. 32, fig. 2 (1921).

THE USE OF ALCOHOL IN PLANT COLLECTING

W. H. Hodge

Recently R. E. Schultes (Rhodora **49:** 54–60. 1947) has given us a valuable account of Paul Allen's method of preparing herbarium specimens with the aid of formaldehyde. Schultes points out that the method is useful in the wet tropics, expecially where rather limited collections are to be made and where transportation and drying problems are difficult. I should like to append to his article a brief description of another agent, alcohol, which is used in a fashion similar to formaldehyde, to which under certain conditions it may prove superior. Since Schultes has summarized the difficulties of a botanical collector in the wet tropics and the concomitant reasons for treating with formaldehyde, I will not repeat the same problems but suggest that the reader review the present article in conjunction with that of Schultes.

I owe the method here described to Augusto Weberbauer of Lima, an eminent student of the Peruvian flora. In a lifetime of extensive field collecting in some of the most difficult terrain in this hemisphere, Professor Weberbauer has found alcohol to be most useful in the preservation of all kinds of herbarium material. I can recommend it as well, for during two and a half years of wartime field work as a cinchona botanist in Peru, I used Weber-

bauer's method almost entirely. The great distances to be covered in that country, the lack of time for drying in the field, the limited number of mules or Indian carriers which placed a definite limit on the amount of field equipment carried, the war emergency that required a single botanist to do many tasks unrelated to his science—all these were ample arguments against dallying in the field with ordinary and bulky drying equipment. And because our field work was largely limited to a special group, the genus *Cinchona* and its close relatives, our plant collections were small.

As with formaldehyde, the principal value of alcohol is not in eliminating standard drying procedure but rather in preserving plants in good condition and for indefinite periods until they may be pressed and dried carefully in a location where drying facilities are available and subsequent safe storage may be effected. The advantages of alcohol over formaldehyde are principally three: 1) alcohol, in one form or another (rum, aguardiente, etc.) is nearly always available in out-of-the-way places; in general wherever you find man you find some kind of usable alcohol; for this reason there is seldom any need of carrying alcohol on a trip, at least not for any great distance; 2) alcohol—any crude local form will do—is relatively inexpensive, unlike formaldehyde which is a costly reagent throughout Latin America; 3) alcohol is not an irritant and does not have to have special handling. There are enough inconveniences in the field without having to worry about skin-cracking and possible infections resulting from such injuries.

Specimens treated with either formaldehyde or alcohol must be shipped in some kind of air-tight container which will not permit evaporation. Besides the alcohol and the usual supply of pressing paper, one needs a box of some kind. Schultes mentions the possibility of wrapping formaldehyde-dipped specimens in pliofilm. Presumably such a covering would work also with plants preserved with alcohol but care should be taken that such material be so wrapped that the pliofilm covering is well protected; a hole made in this wrapping during shipment and permitting evaporation of the alcohol would result in worthless specimens. In Peru I originally used light but strong plywood boxes into which fitted a removable metal box, made to the

internal dimensions of the former. The metal box with its removable cover could be sealed tightly by means of strips of one-inch-wide surgeon's tape which could be waxed over lightly, after sealing, by rubbing with an ordinary candle. The outer wooden box was merely a protective shell against the hard knocks of transit. The dimensions of a box of this type need not be standardized but in width and depth should be just equal to a standard folded newspaper (or a 12 x 18 inch collecting sheet). The length of the box may vary but is usually limited to the size demanded (24–30 inches) by the type of transportation agent—in Andean Peru a mule or an Indian's back. It must be remembered in mule transport that boxes should be in equal-sized and equal-weighted pairs to counteract the danger of shifting cargo on treacherous trails. Boxes of the type described were fitted with padlocks because they served our parties in a double capacity. Since they were more or less watertight and vermin-proof, they could be utilized to carry food and provisions until empty, whereupon they became available for the storage of specimens. Later in our work we had a local metal shop make up sturdier galvanized boxes of the same dimensions but without wooden covers. These functioned well although without the protection of the wooden cover it was more difficult to protect the taping against pulling or rubbing off in transit. In some parts of the Andes I have seen crude, heavy, and rainproof leather boxes used for cargo and these would make excellent protective covers for metal boxes.

Freshly collected specimens are placed in regulation-size folded newspaper stock on which is added the collection number and any other necessary data. I have found that the subsequent use of alcohol does not eliminate pencilled notations, but I have always preferred and have used heavy wax or other types of colored marking pencils. Once annotated or numbered, the specimens may be placed directly in the collecting box—no pressing of any kind is necessary. Alcohol is added at this time, and usually, as I have stated above, in the form of some kind of locally available native drink (a shocking thing to the Indian aides who can never understand such wasteful procedure!). The liquid is poured over the papers but only in a quantity sufficient thoroughly to moisten them. A little excess liquid in the

bottom of the tin box will do no harm. The metal cover of course should be immediately put in place after the alcohol is added in order to prevent loss from evaporation. Just as in a press, a collecting box of this type will hold as many specimens in their papers as can be squeezed tightly into it. When full the cover is sealed with the tape and then waxed, but before this is done one should be certain that all papers are reasonably moist with alcohol. Experience has shown that plants, if untampered with, are good for several months of perfect preservation in such a box once it has been sealed.

Boxes containing specimens temporarily preserved in this manner in a saturated atmosphere of alcohol, are light in weight and lend themselves to all methods of transport including shipment by air. Thus upon our arrival in a populated district after a long trip, it was our custom to air-express the containers to the museum of the University of San Marcos in Lima where aides would open the boxes, remove the plants, and prepare them for the herbarium, handling them during the drying process exactly as though they were fresh material. The empty boxes could be returned by air to the field party. Herbarium specimens made in this way appear to be just as satisfactory as specimens prepared by normal procedures, and in fact they are less brittle than those obtained from fresh material and dried immediately by artificial heat. Of course, and as with formaldehyde, all natural colors are lost, the specimens appearing brownish. For this reason it is imperative that the botanist record all such data at the time of collection in the field.

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TWO EASTERN AMERICAN SPECIES OF IRIS

M. L. Fernald

Iris Hookeri Penny, forma **pallidiflora** (Fern.), comb. nov. *I. setosa* Pallas, var. *canadensis* M. Foster, f. *pallidiflora* Fern. in Rhodora, xxviii. 168 (1926).

I. Hookeri, forma **zonalis** (Eames), comb. nov. *I. setosa*, var. *canadensis*, f. *zonalis* Eames in Rhodora, xi. 91 (1909).

The blue-flowered *Iris Hookeri*, so distinct in its dense habit, with strongly multicipital base with erect crowns, low stature,

petals reduced to awn-tipped rudiments only 1 or 2 cm. long, and papery beakless capsules, carpets the crests of sea-cliffs or bluffs, the turf back of or upper borders of sea-beaches and other dry or dryish maritime habitats from latitude 58° on the outer coast of Labrador south in an extremely narrow but interrupted belt, rarely 100 feet wide, on the coast to latitude 44°, midway on the coast of Maine, with an intrusion up the lower St. Lawrence to Charlevoix and Montmagny Counties, Quebec. In recent years it has been treated as an eastern variety of the Beringian *I. setosa* Pallas: *I. setosa*, var. *canadensis* M. Foster in Rhodora, v. 158 (1903). Prior to Sir Michael Foster's announcement that it is only a relatively low and isolated eastern variety of the taller species of northeastern Asia and Alaska, the eastern plant had regularly passed as *I. Hookeri* Penny (1832). After a period of more than 40 years, in which Sir Michael's interpretation has been generally accepted, I find myself unable to maintain *I. Hookeri* as merely a variety of *I. setosa.*

The latter is a relatively tall plant, with loosely branching crown, the many specimens before me showing the horizontal to oblique rhizomatous branches of the loose crown 4–10 cm. long and bearing fibrous remnants of decayed leaves; *I. Hookeri* being very densely cespitose, the closely crowded erect or ascending crowns retaining intact many marcescent and undecayed old leaves. *I. setosa* has thinnish arching basal leaves; those of *I. Hookeri* are firm or stiff and strongly ascending or erect. *I. setosa* has well developed thinnish cauline leaves, the upper one or that below the lowest fork in forking stems mostly 1–3 dm. long; whereas the flowering stem of *I. Hookeri* is leafless above the base or it may have 1 (on branching stems 2), very firm and stiff upper cauline navicular blade 4– rarely 15 cm. long, borne definitely above the longer basal blades. Of the 270 flowering or fruiting stems before me 42 are quite naked between the tuft of basal leaves and the spathe. In *I. setosa* the outer spathe-bract is blunt to merely acute and usually scarious-margined; in *I. Hookeri* attenuate to a sharp tip and more generally herbaceous. In *I. setosa* the crest of the style-branch is fringed with acicular processes; in *I. Hookeri* the 2-lobed crest has broader and blunter teeth.

I. setosa is a paludal species; *I. Hookeri* non-paludal, most often

a *chasmophyte*, and regularly avoiding the swampy, boggy or marshy areas. This difference in habitat is clearly brought out by such labels as record such usually neglected items and by many reports of field-observers. Thus for *I. setosa* we get the following statements: "bogs", *Van Dyke*, no. 260; "streams", *Harrington;* "wet meadow", *J. P. Anderson*, no. 6624; "meadow", *Nelson & Nelson*, no. 4360; "swamps", *Mrs. Henry B. Looff*, no. 118; "In paludibus", Kudo, Fl. Isl. Paramushir, 94 (1922); "In peninsula nostra tota in pratis ripariis vel silvaticis, in pascuis, ad ripas aquarum et in paludibus sphagnosis gregaria saepe occurrit", Komarov, Fl. Penins. Kamtsch. 308 (1927); "In South Kamtchatka *I. setosa* is a common plant occurring in nearly all lowland associations belonging to the meadow series . . . In the drier formations it is very often sterile", Hultén, Fl. Kamtch. i, 256 (1927); "In meadows and boggy places", Tatewaki & Kobayashi, Contrib. Fl. Aleut. Isl. 117. (1934); "spreading over acres of marshland", Sharples, Alask. Wild Fl. 69 (1938); "Common in marshy places of the interior; on the Bering Sea coast often in wet, brackish meadows", A. E. Porsild in Rhodora, xli. 214 (1939).

As already implied, *Iris Hookeri* finds it very unhealthy, apparently fatal, to have its feet wet. During an intimate field-acquaintance with it, through long periods of summer from 1902 to 1929 my companions and I never saw it in a positively marshy, swampy, or boggy spot nor often in brackish or saline marsh. From the 85 labels before me which clearly indicate the habitat the following summary is derived: rocky or gravelly sea-shore, 16; dry to moist turf or gravel back of beach, 13; dry to moist sands or dunes, 13; humus or meadow back of crest of sea-cliff, 11; dryish upper border of sea-beach, 11; sea-cliffs or headlands, 6; peaty or rocky barrens, 3; dry sandy bluffs or hillsides, 3; talus along coast, 1; springy bank, 1; rocky pasture, 1; salt-marsh, 3; moist place bordering sea, 1; sandy shore back of salt marsh, 1; turfy margin of brackish pond, 1. Of these, it will be noted, only the last 6 are from possibly brackish spots; and when, rarely, *I. Hookeri* approaches the wetter areas it is inclined to cross with *I. versicolor*.

The nomenclature of *Iris Hookeri* Penny ex G. Don in Loudon, Hort. Brit. Suppl. 1: 591 (1832) needs clarification. The first

recognition of it seems to have been as *I. tripetala* sensu Hook. in Bot. Mag. lvi. t. 2886 (1829), where were published a colored plate and a detailed description of a plant cultivated in England and wrongly identified with the Carolinian *I. tripetala* Walt. or *I. tridentata* Pursh. The plate and description are of the maritime plant from farther northeast, though with exaggeratedly long spathes, these, however, being fairly well matched in unusually well developed plants from Newfoundland, such as *Fernald, Long & Dunbar*, no. 26,524 from turfy shore along the Straits of Belle Isle. In his Fl. Bor.-Am. ii. 206 (1839) Hooker placed the plant, without description, under *I. tridentata* Pursh. The name *I. Hookeri* was based exclusively on Hooker's plate 2886. Under that name the northeastern plant remained until the publication of *I. setosa*, var. *canadensis* M. Foster in RHODORA, v. 158 (1903). Apparently the first departure from these two validly and legitimately published names was that of Wherry. In his highly untechnical account of the showier vascular plants of one much visited area, his Wild Flowers of Mount Desert Island, Maine, 37, fig. 24, and 120 (1928) "the arctic[1] Beachflag Iris" is illustrated as *Iris canadensis*, and (p. 120) is enumerated as "*I. canadensis* or *I. setosa*", without any reference to *I. setosa*, var. *canadensis* M. Foster (1903). Just why, when treated as a species, *I. Hookeri* Penny (1832), has to get a new but undefined name, which is said to be equivalent with *I. setosa* (1820), is not made clear, and at best *I. canadensis* Wherry, is a mere *nomen*. However, in the American Iris Society's Alphabetical Iris Check List, edited by Mrs. Wheeler H. Peckham (1929), one finds on p. 71, in the alphabetical series, chiefly of horticultural names, the following sequence: "Camille Thienpont", "CAMMA", "CAMPANEL", "**canadensis.** Trip-B 3 M (Small); *Hookeri, Penny; setosa* var. *Canadensis, Fos.; tridentata.*" Then on p. 132 he finds *I: Hookeri* Penny (1832) reduced outright to the synonymy of the maintained "I. **canadensis**". Dr. R. C. Foster, in his study of North American Iris in Contrib. Gray Herb. no. cxix. 60 (1937), interpreted the new binomial as *I. "canadensis* (M. Foster) Small ex Peckham" and Wherry's *I. canadensis* as based on *I. setosa*, var. *canadensis* M. Foster, although Wherry did not

[1] The Arctic is generally interpreted as including primarily the regions north of the Arctic Circle. The northernmost record which I can find for *Iris Hookeri* is near lat. 58° (well south of the Arctic Circle) on the coast of Labrador.

mention the latter. The Gray Herbarium Card Index has ignored the latter as a mere nomen with no basonym actually cited. At any rate, it is quite unjustifiable to displace the properly founded *I. Hookeri* Penny (1832) by another binomial set up in pretty vague fashion in 1929. Furthermore, the propriety of publishing at this period of plant-nomenclature new *botanical* combinations in a work which is so patently a list of strictly horticultural trivial and not true botanical names may appropriately be questioned, especially when the authors obviously did not understand just what they were doing.

Iris verna L., var. **Smalliana,** var. nov. *I. verna* (Mountain Form) Small in Addisonia, xiv. 15, pl. 456 (1929). Type from oak-barrens, east of Crossville, Cumberland Co., Tennessee, May 2, 1936, *Svenson*, no. 7635 (in Herb. Gray.).

In his very detailed account and beautiful plate of *Iris verna* (Mountain Form) and in his subsequent discussion and plate of true *Iris verna* of the Coastal Plain in Addisonia, xvi. 87, pl. 520 (1936), Small clearly brought out the striking differences between the two series: the Coastal Plain plant (true *Iris verna*), with slender and cord-like whitish straight rhizomes and rootless stolons 2–4 mm. thick and lengthening to 2.5–10 cm. between the thickened rooting crowns, the dark scales becoming remote; var. *Smalliana* of the Blue Ridge, Alleghenies and Cumberland region, southward to northwestern Florida and western Alabama, with the stout and dark torulose rhizome 4–8 mm. thick, with very short constrictions between the thick and freely rooting internodes. The mature leaves of the Coastal Plain *I. verna* become 3–8 mm. broad, with 9–19 ribs; in var. *Smalliana* they are 5–13 mm. broad, with 15–29 (possibly more) ribs. In true *I. verna* the spathe-bracts are subscarious and pale to brownish; in var. *Smalliana* they are firmer and often greener. Small brings out slight differences in the perianths. These I am not situated to verify; but the differences in the capsule I can partly subscribe to, having collected the mature fruits of the Coastal Plain *I. verna*. In this plant the capsule is subsessile or very short-stalked, 1–2 cm. long; while in var. *Smalliana* it is 2–3.2 cm. long and on a stalk up to 2.5 cm. long.

In his first discussion of the "Mountain Form", Small wrote:

"Compared with the present-day members of this group in the mid-Piedmont, the mountain forms are decidedly denser in habit, with shorter and thicker rootstocks, and larger flowers sometimes quite lacking in odor. As the representative of this group which had occupied the Coastal Plain during the Tertiary showed opposite tendencies in these respects, the sum-total of the differences between them is considerable, and were not exact intermediates well developed in their ancestral Piedmont home, the two might well be classed as separate species. As it is, however, they seem best regarded as only geographical forms, as shown in the nomenclature proposed here.

"The known range of the mountain violet-iris extends from South Carolina to West Virginia, usually at relatively high elevations, although it seems to mingle with the Piedmont form to some extent toward the inner edge of that province."

Later, in discussing true *Iris verna*, he wrote:

"On comparing the plants of violet iris which at present grow in the Piedmont of North Carolina and adjoining states with those found on the Coastal Plain, it is found that the latter have developed a more lax habit, with slender, long jointed rootstocks, and a smaller, usually more fragrant flower which has narrower-clawed sepals and longer-clawed petals. These features persist throughout its known range, which extends from central Georgia to southeastern Pennsylvania, on the Coastal Plain and rarely just above the Fall Line on the Piedmont.

"*Iris verna* occurs native in sandy or peaty soil which is strongly acid in reaction, and attempts to cultivate it in ordinary non-acid garden soil have always failed, although it appears to be hardy some distance north of its natural range. While sometimes growing in apparently wet places, its roots are usually well up on dryish hammocks, and it seems to thrive best in sandy open woods where the water table is several inches below the surface."

Others corroborate these observations. Thus, Mr. Francis Welles Hunnewell, having known the loosely stoloniferous plant of the Coastal Plain, tells me that in the Massanutten region he has repeatedly failed to find slender pale stolons on the montane plant; Mr. Carroll Wood, familiar with the latter in the Blue Ridge, makes a similar statement; and Mr. Charles A. Weatherby states that for several years he grew the montane plant, which increased into compact colonies, but that the loosely stoloniferous plant of Coastal Plain sands (in a hotter area than the mountains), although planted in sand, died the first winter. The two are not "forms" in the generally accepted sense but well defined geographic varieties. If the transitions did not occur in the Piedmont they would be as strongly defined as many recognized species in the genus.

TWO NEW FORMS.—

HEPATICA ACUTILOBA DC., forma **plena,** f. nov. sepalis numerosissimis albidis.—MICHIGAN: along an abandoned road near Scott's Cave, Mackinac Island, June 24, 1947, *J. E. Potzger*, no. 10,793 (TYPE in Herb. Gray).

This "double-flowered" form, sent by Professor John E. Potzger, has the stamens and apparently the carpels all changed to white sepals. Professor Potzger writes that several clumps were noted, all of their flowers of uniform character.

CORNUS RUGOSA Lam., forma **eucycla,** f. nov., foliis maturis orbicularibus vel rotundo-obovatis vix apiculatis tenuissimis.—NOVA SCOTIA: Great Bras d'Or, Iona, Victoria County, August 6, 1946, *Edith Scamman*, no. 4393 (TYPE in Herb. Gray.).

Very unusual in its thin mature leaves almost orbicular and with scarcely apiculate tip; typical *C. rugosa* having the firmer leaves broadly ovate to suborbicular and abruptly pointed.—M. L. FERNALD.

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